

WHAT IS CLAIMED IS:

1. An orthogonal frequency division multiplex modem circuit which uses a plurality of subcarriers for communication, and transmits and receives a plurality of communication channels, wherein each of a plurality of sub carrier groups into which the plurality of subcarriers are divided is assigned to each of the plurality of communication channels.

2. The orthogonal frequency division multiplex modem circuit according to claim 1, wherein the assignment of sub carrier groups to the respective communication channels is adaptively performed.

3. The orthogonal frequency division multiplex modem circuit according to claim 1, wherein a modulation system given to each of the sub carrier groups is changed according to QoS (Quality of Service) needed for a corresponding communication channel.

4. The orthogonal frequency division multiplex modem circuit according to claim 1, wherein means for randomizing alignment of the respective subcarriers on a frequency axis is included in a transmitting side, and means for de-randomizing a signal where the alignment is randomized is included in a receiving side.

5. The orthogonal frequency division multiplex modem circuit according to claim 2, wherein all subcarriers are assigned to

09379333-061204

asinglechannelasrequired,whilecommunicationofotherchannels
is stopped.

6. The orthogonal frequency division multiplexing modem circuit according to claim 3, wherein the changeable modulation system
5 uses at least any one of BPSK (Binary Phase Shift Keying), QPSK (Quadrature Phase Shift Keying), and QAM (Quadrature Amplitude Modulation), and a symbol point on a phase plane is changed according to the QoS.

7. The orthogonal frequency division multiplex modem circuit
10 according to claim 3, wherein peak values of modulation symbols
are determined so that transmission power of the respective
subcarriers becomes the same irrespective of the modulation
systems.

8. The orthogonal frequency division multiplex modem circuit
15 according to claim 4, wherein the processing for randomizing
positions of the respective subcarriers is updated every symbol.

9. The orthogonal frequency division multiplexing circuit according to claim 8, wherein means for determining the randomization pattern every symbol and transmitting the randomization pattern every symbol to the receiving side is included in the transmitting side, and means for synchronizing transmission and reception of the randomization pattern is included.

10. The orthogonal frequency division multiplex modem circuit according to claim 9, wherein a predetermined communication channel and a sub carrier corresponding thereto are assigned as the means for synchronizing transmission and reception of
5 the randomization pattern.

11. The orthogonal frequency division multiplex modem circuit according to claim 10, wherein the predetermined communication channel and the sub carrier corresponding thereto are excluded from the randomization process.

10

05879333-061201
"02T90" E2E6/850